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Description of grinding patches found on granite bedrock near Cue, in central Western Australia, and a discussion of their significance

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Abstract

Patches of exposed granite bedrock around Cue, in central Western Australia, that have been smoothed by being used for grinding are described and compared with portable grindstones recorded in the same region. Patches had rarely been reported from this area before, although they have long been recognised in the Pilbara. The extension into the southern half of Western Australia of a type of evidence for past human behaviour rarely identified there is significant. Two much-debated questions are also considered, but left unresolved due to insufficient data: whether there is a morphological difference between grindstones used to wet mill grass seeds and those used for dry grinding hard seeds and whether the juxtaposition of grinding, generally considered to have been women's work, with rock carvings, usually assumed to have been made by men, is socio-culturally significant.

Keywords: grinding patches, granite bedrock, Cue, central Western Australia

Introduction

Grinding patches can be defined as 'rock pavements or slabs worn smooth by Aborigines grinding on their surface ... they are most commonly found in arid regions, where Aboriginal people, especially women, carried out seed grinding' (Flood 1990). Elsewhere in the same text, she was more specific about what was ground. Grinding patches were 'oval patches of rock worn smooth from women's grinding of grass seeds into flour' (Flood 1990). Later, she widened her definition. A grinding patch became 'a concave abraded hollow on a horizontal or sloping rock surface, usually produced by grinding ochre or foodstuffs such as hard fruits' (Flood 1997).

Flood (1990) also noted that grinding patches are frequently located near petroglyphs (engraved rock art motifs), being found 'close to or even on top of engravings'. For example, in the Pilbara, 600–750 km north of Cue, there are grinding patches at art sites on Gallery Hill, Woodstock (Flood 1990). At Spear Hill, 'there are many seed-grinding patches on the pavements and aprons at the base of conical hills' (Flood 1990). While, on the Burrup Peninsula, there are 'patches of rock worn smooth by grinding by Aboriginal people, usually women, grinding acacia or grass seeds into flour' (Flood 1990).

Later, Flood (1997) stated firmly that grinding patches 'are utilitarian by-products of grinding up foodstuffs, ochre or other commodities'; emphasising that they 'are economic, functional marks left by grinding activity usually on horizontal surfaces or large portable rock slabs. Residue analysis has shown that some grinding hollows were used for pulverising ochre and some for grinding up food substances such as hard fruits. [They] are utilitarian marks which should not be classed as rock art'.

Other authors also emphasise the utilitarian nature of grinding patches. 'Domestic camping activities are evident at sites [around Dampier], particularly grinding patches on the rock where grass-seed flour was made, which was a woman's task; sometimes the grinding occurs between engravings' (Mulvaney and Kamminga 1999). These sites are: Skew Valley, Gum Tree Valley and Kangaroo Valley, studied by Lorblanchet (1992).

The identification in October 2004 of grinding patches on five granite outcrops located within a 50 km radius of Cue (Gunn & Webb 2006), a small town on the Great Northern Highway in central Western Australia (Figure 1), is reported here. At one site, petroglyphs flanked the grinding patches. Such patches, particularly juxtaposed to rock art, had rarely been reported from this area before, although hundreds of patches, with and without artwork, are known further north, particularly in the Pilbara.

Patches can be extremely difficult to see, those reported on here were identified as much by touch as by sight. They are described in this paper in the hope that more may be recognised and reported on in the Murchison-Gascoyne region in future by other researchers. The socio-cultural implications of the geographic distribution of such features in Western Australia and their occurrence close to rock art are then considered. Whether or not there is a morphological difference between grindstones used to wet mill grass seeds and those used for other tasks is also discussed.

Site descriptions

In total, 43 grinding patches were found at six sites in the study area: Afghan Rock, Boat Hole Rock, Camel Soak, *Djungari*, Pool Paddock and Taincrow Rockhole.

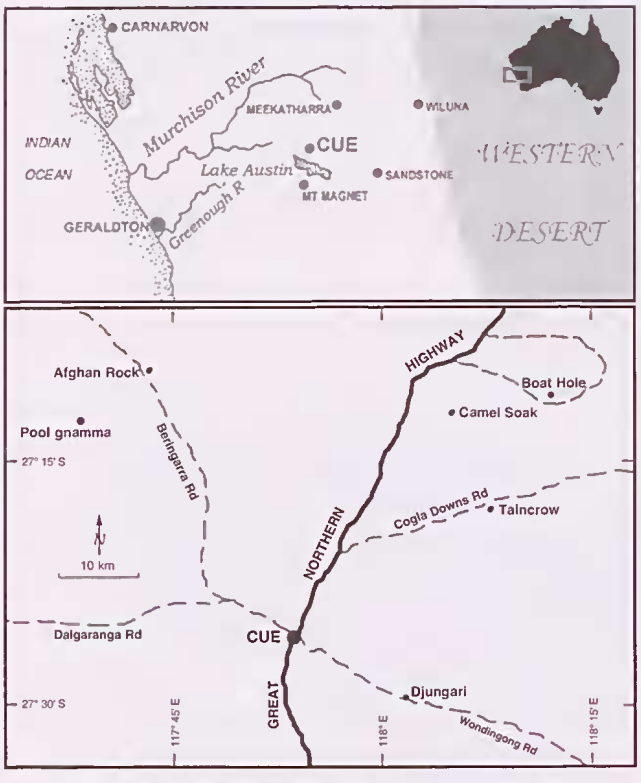

Figure 1. Location of the study area (drawn by AM Rossi).

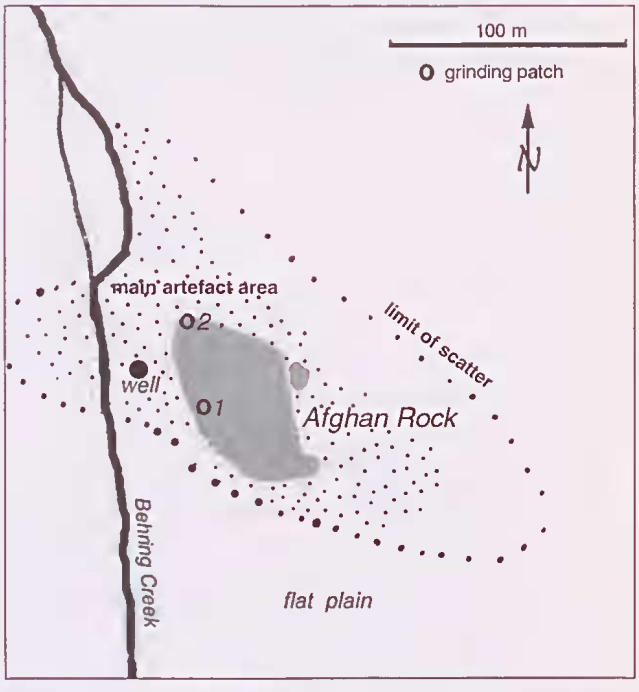

Figure 2. Archaeological features recorded at Afghan Rock (adapted by AM Rossi from an original by RG Gunn).

The dimensions of all the patches that could be measured are listed in Table 1. The numbers in this table correspond with the patch numbers in Figures 2–6.

Afghan Rock

Afghan Rock is a small granite dome, some 80 m x 40 m in area, that rises about 20 m above the surrounding plain, 500 m north of the road from Cue to Beringarra, about 11 km south of The Glen homestead. The dome has a number of large shallow pans on its crest that hold water after rain. According to the present lessee, the well (Figure 2), which is now powered by a wind pump, was originally dug by Afghan cameleers who camped at the rock in the 1880s and gave the place its modern name. There is an extensive scatter of Aboriginal stone artefacts around the dome and beside Behring Creek (Gunn & Webb 2003), suggesting that the Afghan well may have been dug into an Aboriginal soak.

Two grinding patches were located on this dome, about 30 m apart (Gunn & Webb 2006): one on the western side and one on the northern tip (Figure 2). Both are on subhorizontal surfaces close to the soak, about 0.5 m above where the bedrock emerges from the surrounding colluvium. Patch 2 was particularly difficult to see; it is poorly developed.

Boat Hole Rock

Boat Hole is a gnamma (rockhole) that has formed on the crest of a low granite outcrop, located some 13 km east of Tuckanarra, 500 m north of the road to Reedy town site. The gnamma is a pointed oval 6.0 m long, 2.3 m wide and at least 0.5 m deep; its capacity is estimated at 6750 L. Gunn & Webb (2006) located seven grinding patches on the bedrock around the gnamma: patches 1 and 2 are on the edge of gnamma, 3 is nearby, while patches 4–7 are on the edge of the outcrop (Figure 3). Patches 6 and 7 could not be measured because the bedrock on which they formed is now broken. None of these patches is well-used, but all were quite easy to see.

Camel Soak

Camel Soak is a well-vegetated depression beside a large, low granite dome. It was a watering point for cameleers using the old road from Cue to Meekatharra.

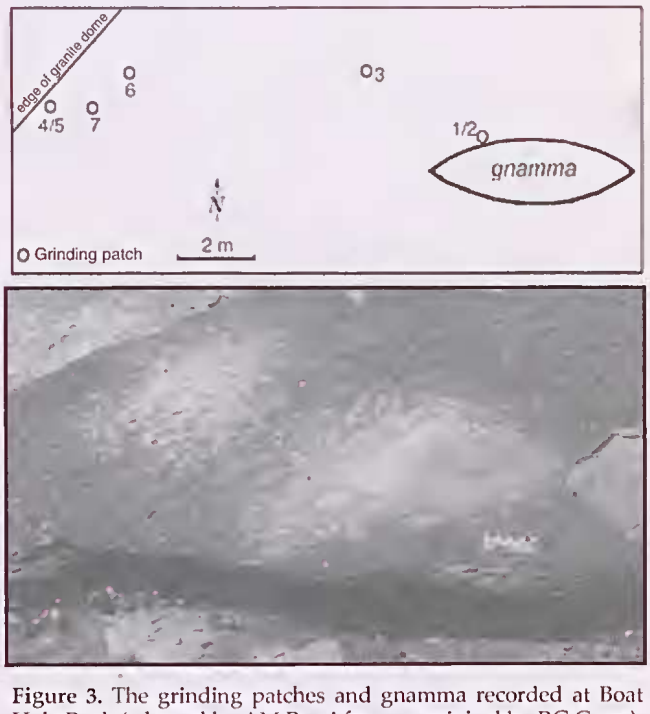

Figure 3. The grinding patches and gnamma recorded at Boat Hole Rock (adapted by AM Rossi from an original by RG Gunn). Patches 4 and 5 are pictured (photo: RG Gunn).

The dome lies east of the Great Northern Highway, 2 km south of Tuckanarra and south of the road to Reedy. The depression is probably an enlargement of a pre-existing Aboriginal soak. It appears to be fed by precipitation running off the adjacent dome. The soak's original dimensions are unknown, but that it may have held a considerable volume of water in the past, is suggested by the dense artefact scatter (40–50/m²) that now covers an area about 300 m x 250 m around the depression (Figure 4 top). The size of this scatter suggests that the area was either visited frequently for short periods, or intermittently for longer periods, by unknown numbers of people.

Five petroglyphs and 14 grinding patches were found, about 20 m from the soak, in an area 10 m by 5 m where the granite emerges at a shallow angle from the present ground surface (Figure 4 bottom). Patch 8 could not be measured because the bedrock on which it formed is now broken. The long axes of patches 1, 6 and 10 are transverse to the slope of the bedrock; that of the others, parallel. The surface on which they have developed is subhorizontal.

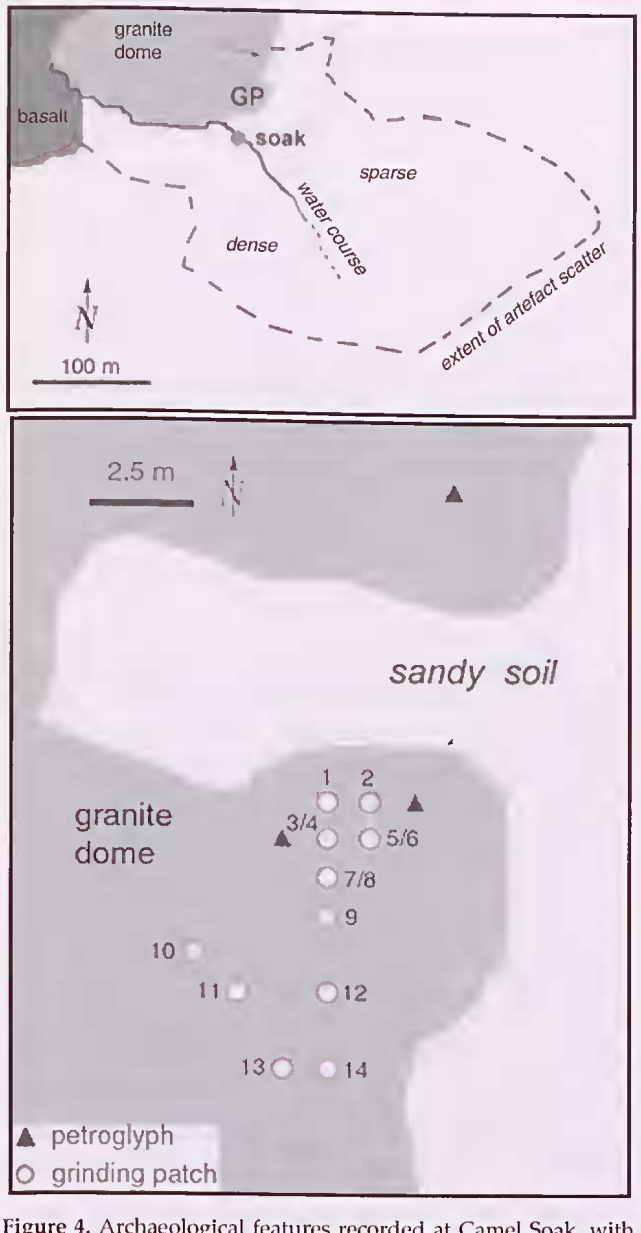

Figure 4. Archaeological features recorded at Camel Soak, with details of the grinding patches (GP) and petroglyphs (adapted by AM Rossi from an original by RG Gunn).

These are the first petroglyphs made on an open granite pavement found in this region, although well-patinated petroglyphs were found on a dolerite dyke 70 km northwest of Cue (Gunn & Webb 2003). Most of the other petroglyphs recorded in this region were made in rockshelters or on protected vertical walls (Gunn & Webb 2000, 2002).

The petroglyphs flanking the grinding patches comprise, west of patches 3–4, a pair of pounded half-patinated emu footprints and a fragment, and a pair of unpatinated abraded macropod tracks, east of patch 2 (Figure 4). Another, isolated, pair of macropod tracks was found 6 m to the north of the grinding patches.

The grinding patches and petroglyphs at Camel Soak are patinated to a similar degree, suggesting that they were made penecontemporaneously and should probably be viewed as a 'set'. Such juxtapositions have rarely been recorded in the southern half of Western Australia. They are discussed further below because they raise the issue of who made what. In the report on this site, we noted that 'the association of grinding patches with petroglyphs is well known in the Pilbara, where it is generally accepted that the patches were probably made by women, while the petroglyphs were probably made by men' (Gunn & Webb 2006).

While these patches and petroglyphs are likely to be of similar age, when they were made is not known because no temporally diagnostic 'formal tools' were noted in the area of the artefact scatter selected for analysis (Gunn & Webb 2006). A quartz flake with some edge retouch was identified, but could not be classified further and is chronologically uninformative.

Djungari

Djungari, also called Garden or Bald Rock, is a prominent granite dome about 1.5 km in diameter that lies about 20 km east of Cue, just north of the road to Sandstone. It is known to have been a traditional campground; rainwater collects in pans on the dome and the surrounding vegetation provides shade, shelter and food. At the northwestern end of the dome, near an ephemeral creek, there are two wells of European construction (Figure 5 top). A fairly dense and extensive artefact scatter was noted across the creek from the wells (Gunn & Webb 2002), suggesting that the wells may be sited near an Aboriginal soak. The area around *Djungari* is very rich in archaeological sites, some of considerable ceremonial significance (Gunn & Webb 2002). That more sites await rediscovery in this area is shown by the fact that five grinding patches have now been identified on the western edge of the dome adjacent to the creekline (Gunn & Webb 2006). All are on horizontal surfaces only a few millimetres above the ground surface and less than a metre from the edge of the dome (Figure 5 bottom). No grinding patches were found near any of the gnammas known in the surrounding area, despite a careful search.

Pool Paddock

Pool Paddock on Coodardy pastoral lease, northwest of Cue, contains a gnamma measuring 2.6 m x 1.8 m x >

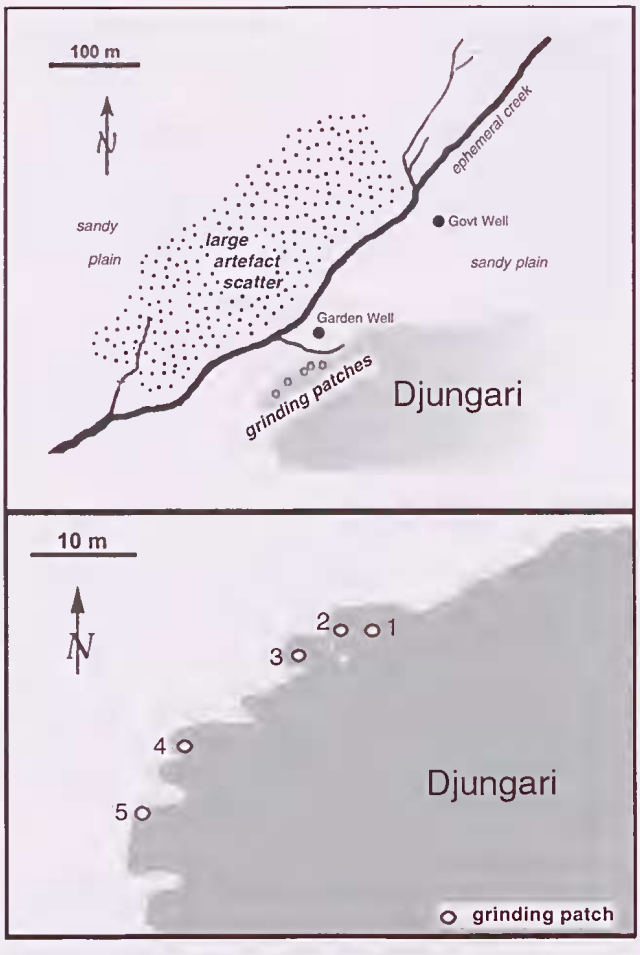

Figure 5. Archaeological features recorded at *Djungari* dome and details of the grinding patches (adapted by AM Rossi from an original by RG Gunn).

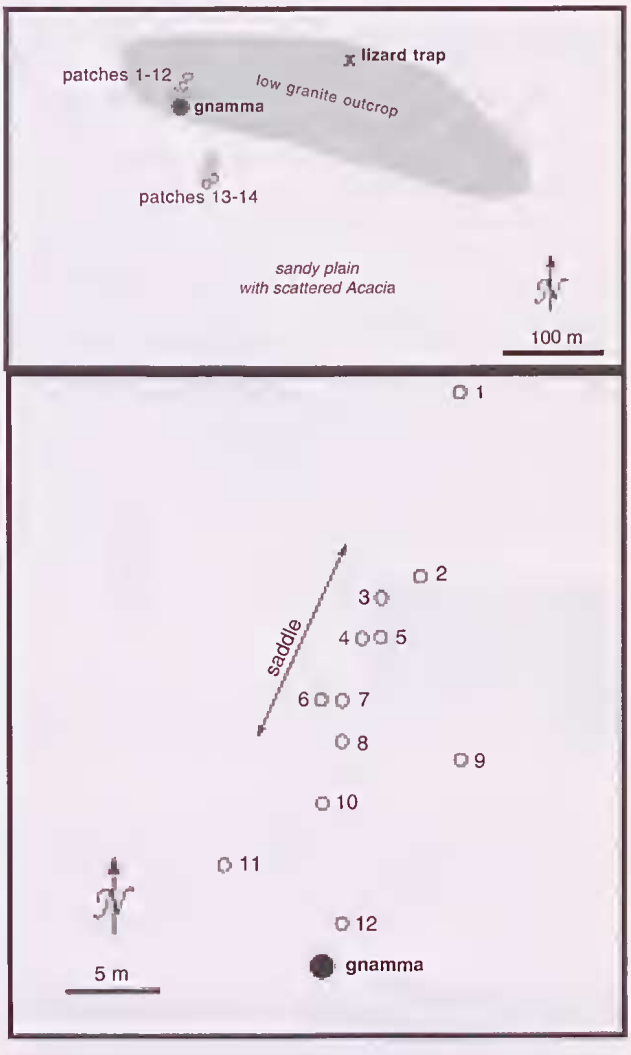

Figure 6. Archaeological features recorded around Taincrow Rockhole and details of grinding patches 1–12 (adapted by AM Rossi from an original by RG Gunn).

1.5 m with an estimated capacity of at least 6000 L (Gunn & Webb 2003). This gnamma has formed in an inconspicuous granite pediment. Very few artefacts were noted on the ground around the gnamma, but a grinding patch, measuring 400 mm x 200 mm, has developed on its eastern rim, indicating that Aboriginal people camped near this water source in the past. The significance of this patch was not appreciated when it was recorded in 2002 because it was an isolated find. This site is located about 7 km southwest of Afghan Rock and can now be seen to belong to the suite of sites described in this paper.

Taincrow Rockhole

Taincrow gnamma measures 3.0 m x 2.3 m and is at least 1 m deep, an estimated capacity of 5000 L. It has formed on the west side of a low granite outcrop (Figure 6 top). A cluster of 12 grinding patches was found on the flat or slightly sloping surface of the granite within 30 m of the gnamma (Figure 6 bottom); patch 1 is on the upper surface of a 1.2 m long block of granite resting on bedrock (Gunn & Webb 2006). Patches 13 and 14 were found on a separate inconspicuous pavement, 100 m to the south of the gnamma and barely emergent from the surrounding colluvium.

A lizard trap was also identified on the north side of the outcrop housing the gnamma (Figure 6 top). It is the first, and as yet *only*, lizard trap found near Cue (Webb in press). All the lizard traps recorded to date in Western Australia are made from and positioned on granite, however. It is possible, therefore, that further traps may await identification around Cue, which is located on the Archaean granites of the Yilgarn Craton (Myers & Hocking 1988).

Summary

The 14 grinding patches found at Taincrow Rockhole were the first noted east of Cue by Gunn & Webb (2006). Subsequently, we found 14 patches at Camel Soak and seven at Boat Hole Rock; also on granite outcrops east of Cue. This plethora of a type of evidence of past Aboriginal activity, previously only noted at Pool gnamma (Gunn & Webb 2003), west of Cue, prompted us to re-visit some of the other granite domes and outcrops in the region to see whether they hosted grinding patches that we had overlooked during previous surveys. As a result, two grinding patches were found at Afghan Rock and five at *Djungari* (Gunn & Webb 2006). All told, 43 patches have now been recorded at six sites within a 40

Table 1

Dimensions in millimetres of all the measurable grinding patches noted at granite exposures around Cue (Gunn & Webb 2006). The patch numbers match those in Figures 2–6.

patch	Afghan Rock	Boat Hole	Camel Soak	Djungari	Pool Pddck	Taincrow
1	260 x 170	300 x 160	750 x 600	230 x 130	400 x 200	200 x 120
2	360 x 260	250 x 160	250 x 150	280 x 220		150 x 100
3		520 x 280	380 x 150	400 x 200		270 x 230
4	"	650 x 450	270 x 170	200 x 180		210 x 150
5		500 x 320	500 x 250	310 x 290		350 x 250
6		broken	550 x 300			200 x 120
7		broken	400 x 220			250 x 140
8			broken			350 x 200
9			350 x 350			300 x 250
10			330 x 200			170 x 120
11			340 x 220			160 x 120
12			400 x 250			350 x 220
13			660 x 350			350 x 180
14			380 x 300			280 x 180

km radius of Cue. No grinding patches were found at the other granite exposures situated near water that we re-inspected.

Analysis

The position of each grinding patch was determined by placing a Global Positioning System receiver (GPS receiver) in the middle. Each patch was measured along its longest axis (length) and orthogonally (width) (Table 1). Depth was not measured, it was too slight: < 1 mm. Three patches could not be measured because the bedrock on which they had formed had subsequently broken, leaving one or other axis incomplete. Individual patches range in size from 150 mm x 100 mm to 750 mm x 600 mm (Table 1). Mean size is about 300 mm x 200 mm; approximating the average size, 310 mm x 160 mm, reported by Grant (1992) for the 487 grinding patches she measured on granite bedrock at Esmeralda Station in northwestern Queensland.

It is probable that patch size relates to the ergonomics of grinding, on which there are no data; so I experimented. A muller can comfortably be pushed about 450 mm away from oneself, when seated cross-legged. Grinding the area immediately in front of one's crossed legs is difficult, however. Hence, the area ground stretches about 300 mm away from the person doing the grinding; the orthogonal dimension may be more variable. I could comfortably cover an area about 400 mm wide. Several of the patches reported on here are much larger than 300 mm x 400 mm, however. All the very large patches are at Boat Hole Rock and Camel Soak. They could be the result of two separate patches merging over time, or be places where two people worked together, although the worn faces are evenly smooth, or they may simply be different from the smaller patches. It is impossible, as yet, to discriminate between these suggestions.

The grinding patches at Boat Hole Rock and Camel Soak might also be bigger than those at Afghan Rock, *Djungari* and Taincrow because water was available more frequently or more reliably at Boat Hole and Camel Soak, allowing greater numbers of people to camp there more often or for longer periods than at the other sites. Boat Hole gnamma is capacious and easy to cover, being long and narrow. It would have been an important source of water to people living in the area in the archaeological past because no other water sources are known within a radius of several kilometres. On the other hand, few artefacts were noted on the colluvium west of the outcrop in which this gnamma has developed; occupation seems to have taken place 200 m to the east at a short stretch of breakaway, where there is a sparse artefact scatter (Gunn & Webb 2006). In contrast, an extensive artefact scatter was found at Camel Soak, suggesting that the site was visited often and/or for long periods and/or by many people. More sites where grinding patches on bedrock are situated close to water would need to be found around Cue before the significance of the pattern just described could be assessed, however.

The grinding areas on 17 grindstones were measured during earlier surveys around Cue (Table 2). In Figure 7 their dimensions are compared with those of the grinding patches on bedrock. This Figure shows that there is no appreciable difference in size between the ground areas on flat and dished grindstones, but that the grinding areas on grindstones are usually smaller than those of bedrock patches.

The grinding area on a grindstone is, obviously, always smaller than the host rock, whose dimensions were probably constrained by weight. Grindstones must be portable. They are usually made of stone not available in the immediate vicinity of where they are found. All the grindstones listed in Table 2 were made from granite. The weight of the largest is estimated to be 29 kg, based on the average density of granite: 2.8. This is about the maximum weight one person can lift and carry easily. The large granite slab hosting grinding patch 1 at Taincrow Rockhole is estimated to weigh about 375 kg and is probably *in situ*. Weight restrictions obviously do not apply to bedrock, hence grinding areas can be bigger, as the very large patches at Boat Hole and Camel Soak demonstrate. Until more grinding patches on bedrock are found in this region, the difference in size between them and the grinding areas on grindstones cannot be explored further.

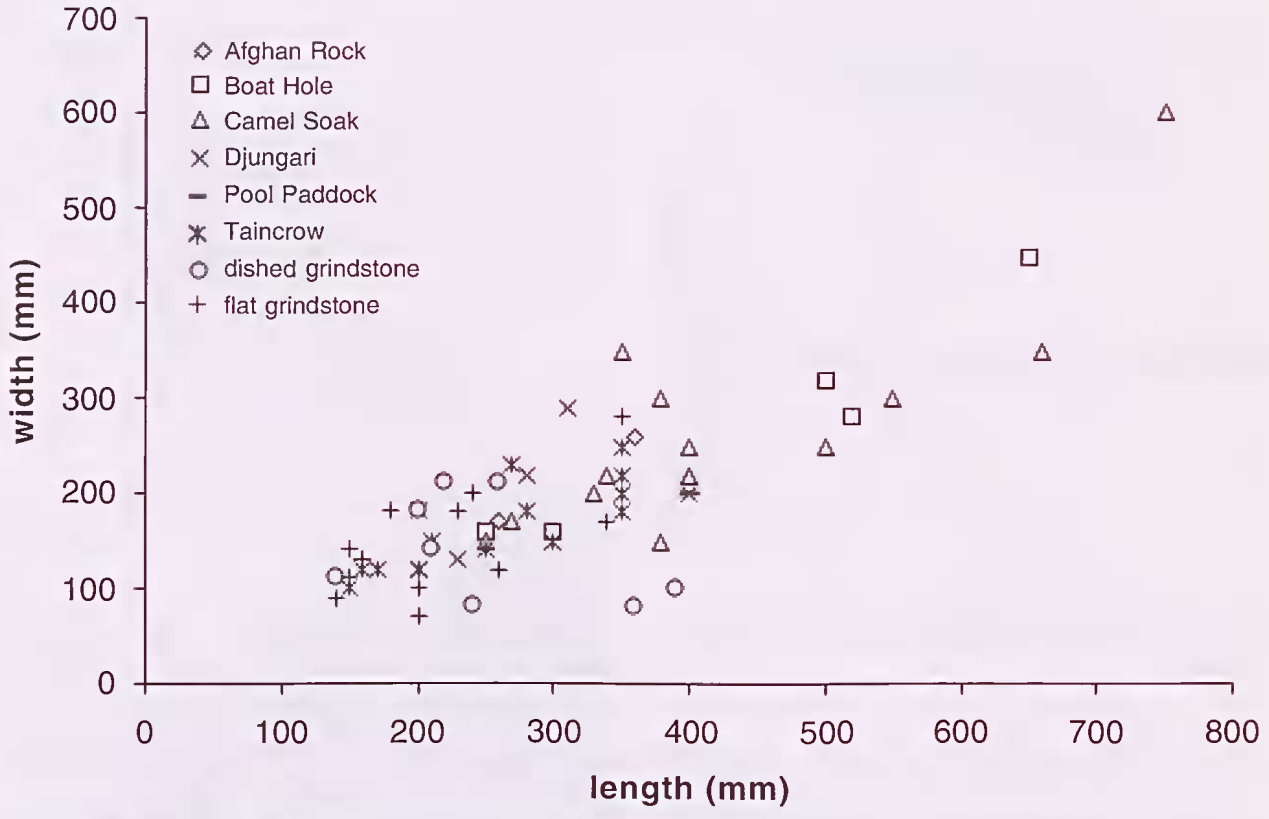

Figure 7. Length and width of grinding patches found around Cue and of the grinding area on some portable grindstones measured by Gunn & Webb (2002, 2003, 2006).

Table 2

Dimensions in millimetres of portable grindstones, and their grinding areas, recorded at sites around Cue (Gunn & Webb 2002:91, 2003:87). The bifacial stone marked by * has a dish ground into the flat grinding area on one side.

type	host L x W x D	grndg L x W x D
unifacial, flat	330 x 260 x 70	150 x 140 x <1
unifacial, flat	400 x 280 x 190	350 x 280 x <1
unifacial, flat	430 x 260 x 90	260 x 120 x <1
unifacial, flat	250 x 140 x 70	200 x 70 x <1
unifacial, flat	250 x 180 x 80	230 x 180 x <1
unifacial, flat	260 x 230 x 75	180 x 180 x <1
unifacial, flat	210 x 150 x 70	160 x 130 x <1
unifacial, flat	420 x 240 x 75	340 x 170 x <1
unifacial, flat	440 x 370 x 50	200 x 100 x <1
unifacial, flat	200 x 200 x 50	140 x 90 x <1
unifacial, well-used	165 x 135 x 60	150 x 110 x <1
unifacial, dished	350 x 210 x 100	200 x 180 x <1
unifacial, dished	330 x 150 x 55	240 x >80 x <1
unifacial, dble dish	510 x 340 x 60	390 x 100 x 40
dish 2		360 x 80 x 20
trimd bifacial, dish	380 x 350 x 70	210 x 140 x 10
'reverse', dished		140 x 110 x 10
bifacial, dished	270 x 220 x 80	260 x 210 x 1.5
'reverse', flat		160 x 130 x <1
*bifacial, flat/dish	340 x 300 x 90	220 x 210 x <1
'reverse', flat		240 x 200 x <1

Discussion

There appears to be a north-south divide within Western Australia in some aspects of Aboriginal culture that is reflected in rock art and the occurrence of grinding patches on bedrock. Almost all the grinding patches on the site register maintained by the Department of Indigenous Affairs (DIA) were found in the northern half of the State: the Pilbara, Kimberley and Great Sandy Desert (Figure 8). While the rock art made in northern and southern Western Australia is also different (Davidson 1952), as discussed further below. This discussion explores the occurrence of grinding patches in relation to geology, the cultural evidence for a north-south divide, the association of grinding patches and rock art, and whether grass seeds were ground on specialised grindstones.

Grinding patches and bedrock geology

The DIA on-line database of site information was searched for sites where grinding had been reported, to provide a context for the sites just described. The database does not, unfortunately, discriminate between axe grinding grooves, grindstones, grinding patches on bedrock and burley holes (depressions in which shellfish were crushed into fish bait). The type of grinding can only be ascertained by studying the file of information on each site. I have only studied the files on the 30 sites where grinding has been reported in the southern half of Western Australia. I have also visited many of those sites during two site verification projects for the South West

Aboriginal Land and Sea Council, funded by Edith Cowan University (Webb & Gunn 2004). The grinding at all those sites is either natural weathering, burley holes or axe sharpening grooves. These features are unlike the bedrock patches reported on here. I have also visited many granite outcrops in the Southwest that house gnammas, lizard traps and rock art (Webb & Gunn 2004). Grinding patches were not found at any of them, despite careful search.

At present, the southernmost site where grinding patches on bedrock have been reported is Kockatea Gully, 5 km northwest of Mullewa (Goode 2002). No details of the grinding patches are given in the site file, however, nor can they be identified in the photograph. This site lies just east of the Darling Fault, which marks the western edge of the Yilgarn Craton. This huge expanse of Late Archaean granite stretches halfway to the South Australian border and from north of Meekatharra almost to the south coast (Myers & Hocking 1988). Were grinding on bedrock dictated by geology, patches could be expected to occur wherever suitable bedrock is emergent; whereas, none are known on the southern half of the Yilgarn Craton.

On the other hand, hundreds of sites with grinding have been reported in the Pilbara. The exact number is unclear because some sites are known to have been recorded (and registered) more than once as different sites. Fewer sites are known in the Kimberley and Western Desert. I have not studied the files on any of these sites, so do not know at how many of them the grinding is bedrock patches, rather than portable grindstones. Nonetheless, the available data suggest that grinding patches on bedrock are a distinctively northern phenomenon. The possible reasons for this will now be explored.

Cultural evidence for a north-south divide in rock art as a guide to understanding the distribution of grinding patches in Western Australia

There is other archaeological evidence for a north-south divide. Davidson (1952) argued that the rock art of Western Australia could be divided into a number of geographical provinces. Stencils predominated in the south and west; line drawings, linear forms, surface painting and solid forms in the Kimberley. 'Emu tracks' were common everywhere except the Kimberley; while geometric designs were not found in the Kimberley or Southwestern Australia. He thought polychrome figures were a feature of northern sites, monochromes typical of southern sites; while linear forms were notably more complex in the Murchison region and most complex in the Kimberley. He said that pictograms and/or petroglyphs of animals and anthropomorphic figures were common in the north and almost absent in the south. He saw the Murchison as a transitional zone where handstencils predominated and petroglyphs were uncommon.

Subsequent research around Cue has revised Davidson's scheme (Gunn *et al.* 1997; Gunn & Webb 2000, 2002, 2003, 2006). Pictograms (chiefly handstencils) are widespread throughout the southern half of Western Australia, although the artwork of the Southwest is more complex than Davidson realised (Webb & Gunn 2004). Petroglyphs (peckings and poundings) are more common around Cue than Davidson thought. Half of all the artwork we have recorded is petroglyphic (Gunn & Webb 2006). Some of the motifs, pecked animal tracks and circles, can clearly be linked to the Panaramitee Tradition which is widely distributed across the Australian arid zone, and reaches its highest expression in the Pilbara (McNickle 1985). Panaramitee petroglyphs have been recorded 125 km northwest of Meekatharra (Stokoe 1959), 150 km southwest of Cue (Franklin 1992) and 70 km northwest of Cue (Gunn & Webb 2003), but are unknown in the Southwest. Gunn & Webb (2002) considered the painted, pecked or pounded animal tracks, geometric elements and linear designs they recorded east of Cue not to be Panaramitee. Instead they attributed them to the Yarraquin Tradition, saying that pounding seemed to have developed from pecking. They concluded that stencilling preceded both those techniques. Stencilling also overlapped with both the Yarraquin Tradition and the large paintings at Walga Rock, 50 km west of Cue, which are related stylistically to Western Desert art (Gunn *et al.* 1997; Gunn & Webb 2000).

This brief summary of the rock art evidence suggests that the area around Cue is linked stylistically to both the Pilbara and the Western Desert and should perhaps be viewed as a southwestward extension of the traditions found in those semi-arid regions. It is also linked to the Southwest by stencilling, which is ubiquitous worldwide.

The area around Cue may also be linked more closely to the Pilbara and Western Desert than to the Southwest by the diet and social customs of its occupants. Grinding on bedrock seems to be related to seed consumption, which played a large part in the diet of Aboriginal people living in arid and semi-arid Australia (Tindale 1977; Smith 1989). Tindale (1974) showed the area where grass seed flour was an important element in Aboriginal diets, his *Panara* culture, spreading across the inland Pilbara as far south as the area around Cue. He said the people of the Murchison region, who now call themselves Yamaji, 'were the southwestern-most people to extensively exploit grass seeds and wet-grind them for the making of forms of bread' (Tindale 1974). The grinding patches on bedrock recently found around Cue support Tindale's contention that the Yamaji ground grass seeds; suggesting they were more closely linked socio-economically to people in the Pilbara than they were to the Noongar to the south. Noongar people did not grind grass seeds; they seem to have relied on tubers as their carbohydrate staple (Grey 1841; Meagher 1974). The Yamaji also ate tubers, of course (Webb 2000).

By the time anthropologists began to study the Yamaji, they were following Western Desert initiation rites, circumcision and subincision, which Tindale (1974) thought spread into the Murchison from the Kimberley or Western Desert, just before the British arrived in Western Australia in the 1820s. These practices separated them from the coastal people to their west and the Noongar to their south whose initiation rites did not include either circumcision or subincision. The division between people who followed those practices and those who did neither appears to have been profound and acrimonious (Gibbs & Veth 2002).

Considered together, this artistic, dietary and cultural evidence suggests that the occupants of the Cue region had closer links with the people to their north and east, than with those to their south and west. Those links become clearer when the places where grinding patches have been found associated with rock art are considered.

Grinding patches and rock art – women's work, men's business?

About 650 sites where grinding is associated with rock art have been reported in Western Australia: 87% in the Pilbara and 11% in the Kimberley (Figure 8). The remaining sites are more widely scattered, although very few have been reported south of 26° S. Not all the registered sites could be plotted on Figure 8 because DIA suppresses the co-ordinates for sites whose files are *closed* for cultural reasons, about 10% of the total known. Nonetheless, Figure 8 is a reasonable representation of the geographic distribution of the sites where rock art has been found in association with grinding; whether that grinding is bedrock patches or portable grindstones is unknown. As noted above, the on-line DIA database does not distinguish between these types of grinding. The distribution pattern seen in Figure 8 does, however, seem to comprise two major regions: the Pilbara and the Kimberley.

In the Pilbara, grinding is associated almost exclusively with petroglyphs. A few sites with both pictograms and

Figure 8. Sites where grinding has been reported in association with rock art. (Drawn by J Smith).

petroglyphs are known, but none with *only* pictograms. In contrast, at half the Kimberley sites, grinding is associated *solely* with pictograms (stencils and/or paintings). Both petroglyphs and pictograms were reported at the other Kimberley sites. If this dichotomy is real, then two sites need to be explained: Mount Ridley, 65 km north of Esperance, and The Granites, 90 km south of Cue. Mount Ridley may be unique. The grinding patch there seems to have been used solely for grinding ochre (Smith 1997). It is located *within* a decorated shelter, whereas patches presumed to have been used for grinding flour are usually found in the open air. The Granites is a major mythological and ceremonial site complex located a few kilometres northeast of Mount Magnet where grinding patches, petroglyphs *and* pictograms have been recorded. This is significant, if the distribution pattern in Figure 8 is real, since it links The Granites to both the Pilbara and the Kimberley, or perhaps to the Western Desert. The file on The Granites is closed, so I do not know whether any of the grinding patches are associated with either petroglyphs or pictograms.

The DIA database lists three rockshelters located about 90 km west of Cue as housing pictograms and grinding. I have examined the information on file about these sites. Two were recorded by DL McCaskill in 1975. He found a number of portable grindstones in one; while at the other grooves had been cut into the rockshelter wall. At the third site, Gunn & Webb (2003:52) noted that a block of saprolite had been abraded on its upper surface; a treatment that seemed to us similar to the ritually rubbed blocks Mountford (1976) reported from the Western Desert. These sites have been omitted from Figure 8 because they do not house bedrock patches.

Figure 4 shows that two of the groups of petroglyphs found at Camel Soak frame grinding patches 1–6. The petroglyphs and patches are patinated to the same degree, suggesting that they were made penecontemporaneously. At many sites in the Pilbara petroglyphs have also been found 'close to or even on top of engravings' (Flood 1990). This juxtapositioning suggests that the relationship of one to the other may have been significant when both were made, raising the issue of who made what (Flood 1990, 1997; Mulvaney and Kamminga 1999). It is generally accepted that grinding flour was 'women's work'. Women probably used most of the portable grindstones and made most of the grinding patches on bedrock, which are considered utilitarian, not to be 'classed as rock art' (Flood 1997). Whereas, men are thought to have made most of the rock art in Australia, particularly at ceremonial sites like Walga Rock (Gunn *et al.* 1997). Not all art was sacred or not to be viewed by women, however. Women clearly made handstencils, for example (Gunn 2006). Whether they made petroglyphs is less certain.

Of course, some grinding patches and petroglyphs could have been made sequentially and diachronically. Flood (1990) said that grinding took place 'on top of' petroglyphs at many places in the Pilbara. In such cases, it is possible that by the time the grinding took place the petroglyphs had lost their significance for the people doing the grinding. Just as, at Walga Rock (Gunn *et al.* 1997), new paintings were made over older paintings, possibly because the older motifs were no longer significant to the people making the new ones.

At present, the juxtaposition of petroglyphs and grinding patches at Camel Soak is locally unique, making the site difficult to interpret. It would appear, however, that if men made the petroglyphs, they also either made the grinding patches, or had no objections to women viewing the motifs; they were public images that could be viewed by anyone. Or, maybe women made *both*? There is little possibility of verifying any of these suggestions, now.

On the other hand, the occurrence at Camel Soak of archaeological evidence more commonly found in the Pilbara supports the suggestion made above that the people living in the area around Cue were more closely linked culturally to the Pilbara than to the Southwest.

Were grass seeds being ground?

Tindale (1974) said the Yamaji 'were the southwestern-most people to extensively exploit grass seeds and wet-grind them for the making of forms of bread'. One of his informants told him that the Yamaji 'had an advantage because they placed great reliance on grass seed food, whereas other people lived only on the hammered seeds of shrubs, did not wet mill grass seed and often went hungry'. Who 'the other people' were is not mentioned. Tindale (1974) also said the Yamaji stored both grass seeds and *'bulibuli' (Tecticornia arborea)* seeds for at least six months in kangaroo skin bags or containers. *T. arborea* is a halophytic chenopod (samphire) found at claypans in the semi-arid zone (Bindon 1996). It is called '*kurumi*' in the Eastern Goldfields (Dix & Lofgren 1974). If the Yamaji wet-milled grass seeds, what sort of grindstones did they use? Gunn & Webb (2002, 2003) recorded 42 grindstones during their surveys around Cue. Of these, 15 are dished; two deeply. One of them is pictured (Figure 9 top). The remainder have flat grinding surfaces (Figure 9 bottom), like the patches described above.

Tindale (1959, 1974, 1977) and Smith (1985, 1988, 1989) argued that wet milling grass seeds led to the development of specialised grindstones with deep grooves, that contrasted markedly with 'amorphous' grindstones with flat grinding surfaces that were used for a variety of other tasks. My experiments suggested that pounding (of hard *Acacia* seeds) can be carried out more easily on a flat grindstone, whereas rubbing tends to create grooves, but whether a specialised grindstone was *necessary* to process grass seeds is open to question. From their analysis of grinding material, Davidson & McCarthy (1957) concluded that it was difficult to classify grindstones into discrete types because shape seemed to reflect degree of usage. Gorecki *et al.* (1997) concurred; arguing that, rather than being discrete types, amorphous and double-groove grindstones probably represent opposing ends of a continuous sequence of grindstone development. One of the portable grindstones Gunn & Webb (2002) recorded seems to support that contention. It had a shallow groove ground through a previously flattened face (Figure 9 bottom), suggesting that the way it was used changed over time. Gorecki *et al.* (1997) argued that a really deeply-grooved grindstone, like the one in Figure 9 (top) where the deeper groove is 40 mm deep, would be difficult to use. They suggested that such grindstones were actually discards, not specialised artefacts for wet milling grass seeds. It might

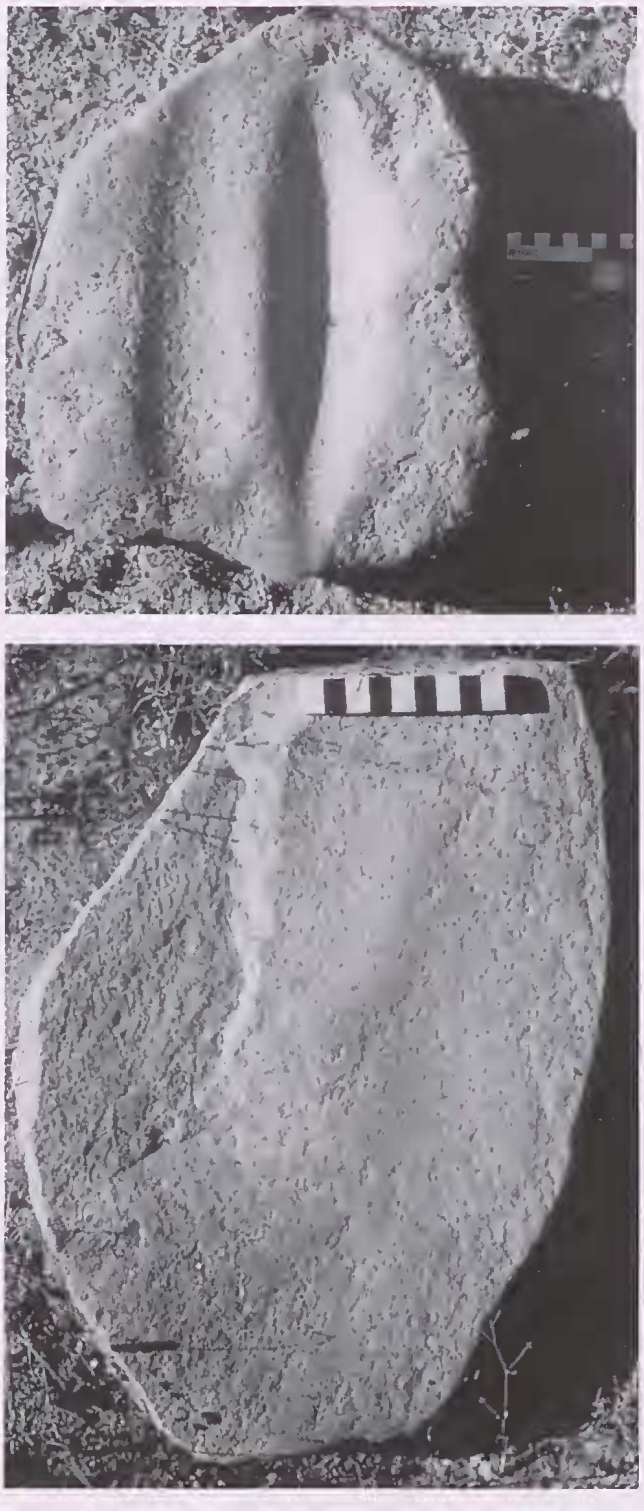

Figure 9. Two grindstones (photos RG Gunn): one with two grooves, one much deeper than the other, the other flat with a secondary dish.

be argued that the deeper groove in Figure 9 (top) had been abandoned for the shallower one, which is 20 mm deep.

Gorecki & Grant (1994) noted that some of the bedrock patches they recorded in northwestern Queensland had striae and carried traces of silica gloss, compatible with grass seed processing. If the people living around Cue were grinding grass seeds, silica gloss might have been found on the patches described here. Keeley (1980) showed that gloss visible to the naked eye develops very rapidly and is durable. It is also unmistakable. I did not see it on any of the bedrock patches found around Cue. These patches were all quite hard to see, except under oblique lighting, being mainly detected by touch. Lantzke (1990) did not mention finding striae or silica gloss on any of the grindstones he studied from around Shark Bay, either. While gloss was not the focus of his research, had it been present, he could hardly have failed to notice it and ought to have mentioned it.

Gorecki & Grant (1994) suggested that the need to transfer the paste produced by wet milling into a container where it could be moulded into damper restricts the shape and location of grinding patches on bedrock: some sort of lip is required at one end of the patch to enable the grinder to scoop up the paste. None of the patches described above have such features; they are simply smoothed areas, sometimes barely distinguishable from the surrounding bedrock. If Gorecki & Grant (1994) are correct, the patches reported on here were probably *not* used for wet milling grass seeds, but for the other tasks for which grindstones are known to have been used (Gould 1969, 1980; Yohe *et al.* 1991; Balme *et al.* 2001): pounding hard seeds, pulverising small animals or grinding ochre.

Conclusion

The grinding patches on bedrock discussed above seem to document a southward extension of an aspect of Aboriginal life that is well-documented in the Pilbara and further north. This link between the area around Cue and the Pilbara is paralleled by some other types of evidence, especially rock art and the presence at one site of petroglyphs flanking the grinding patches. It is concluded that the people living around Cue were more closely linked culturally to those occupying inland northern Australia than they were to those living on the Indian Ocean coast or in the Southwest.

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